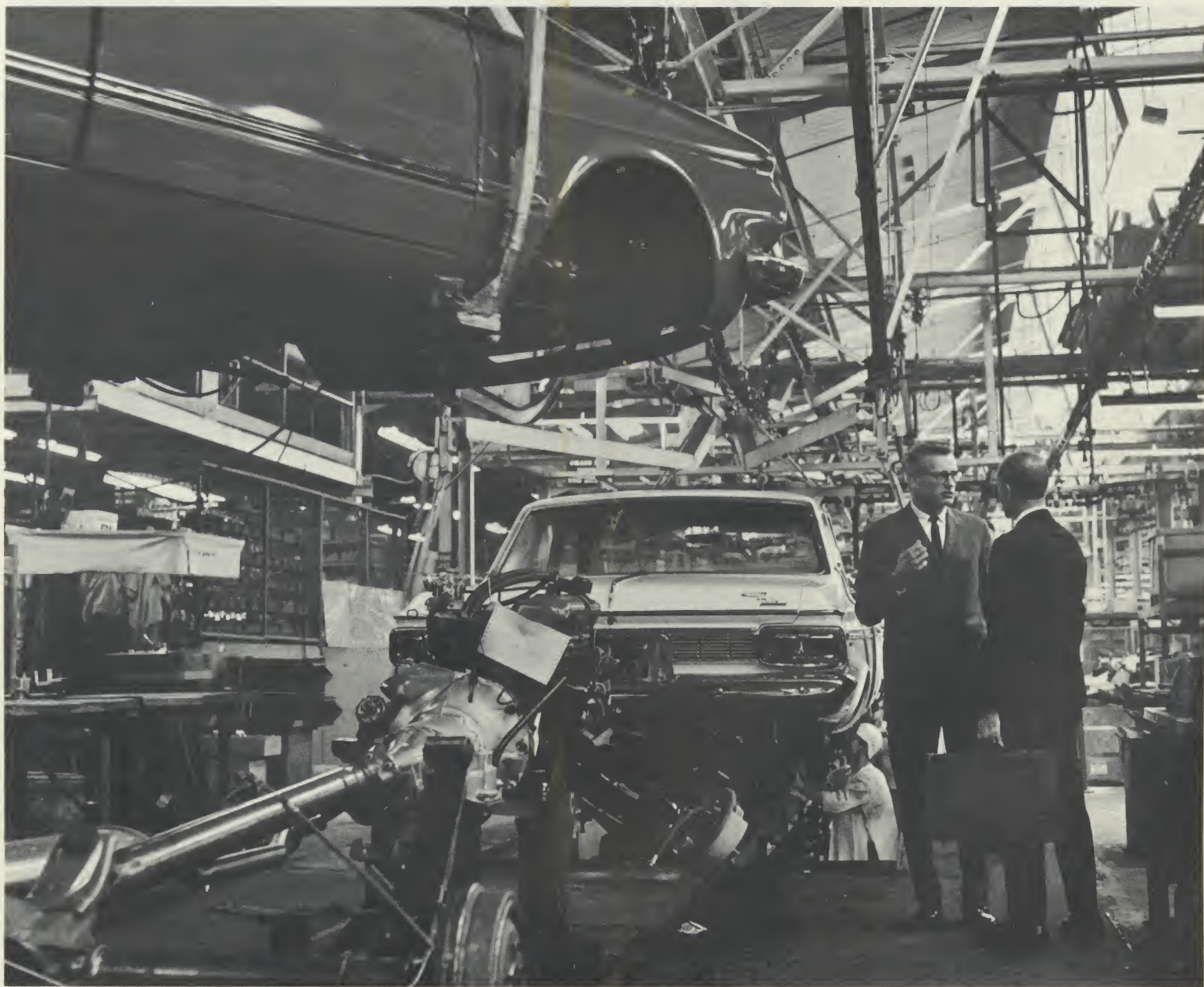
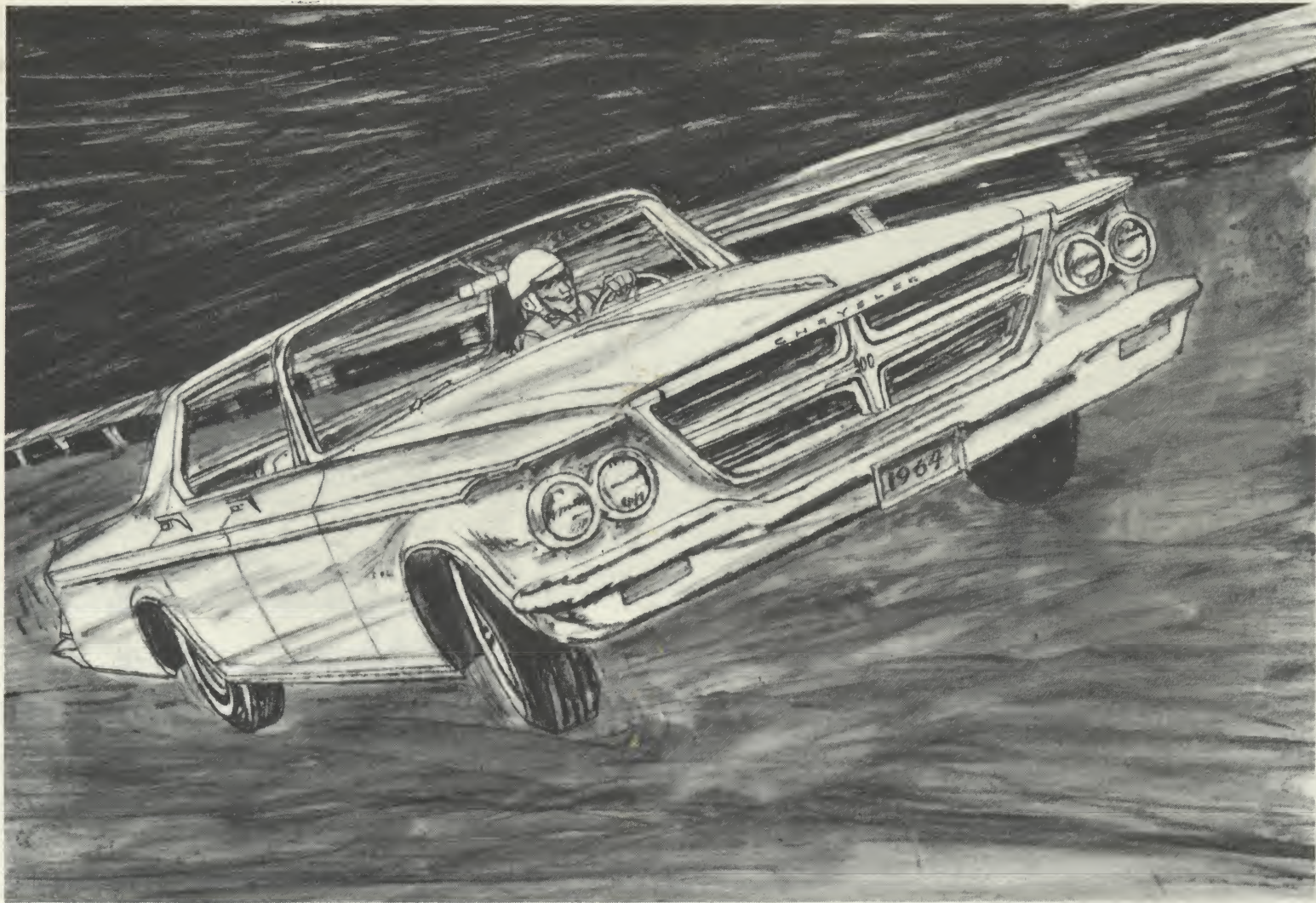


Communications at Chrysler Corporation

served by the General Electric Datnet-30

GENERAL  ELECTRIC





CHRYSLER COMMUNICATIONS

MESSAGES IN QUEUE REPORT

LINE # HOUR 1000 DATE -

LINE #	START Q	START I	END Q	END I	MAX Q	MAX I
1					1	1
2					5	
5		5	3		13	11
6	3			1	6	4
7				11	4	

COMMUNICATIONS

CHRYSLER COMMUNICATIONS

TRAFFIC REPORT

LINE # HOUR 1000 DATE -

LINE #	STATION	SENT	RECEIVED
1	CSNCS	12570	2049
	TOTAL	12570	2049
	MONIT		1542
2	TOTAL		1542

COMMUNICATIONS

CHRYSLER COMMUNICATIONS

PROGRAM	TIMING	REPORT
HOUR 1000	DATE -	
PROGRM	TIME	PER CENT
STORNG	3334	23.76
ERROR	11	.07
SIP	4	.02
FRWRDG	2823	20.12
PROC	2225	15.85
SEARCH	037	58

CHRYSLER COMMUNICATIONS

The “Forward Look” in cars has been matched by a modern, world-spanning communications control system – the General Electric Datanet-30

Chrysler Corporation, designer and manufacturer of prestige automotive and allied equipment, uses a General Electric Datanet-30 to meet its intricate communications requirements. Linking 80 teletype-writer stations on 19 party-line circuits — including far-reaching overseas installations — the Datanet-30 switches traffic in approximately one-third the time it took Chrysler's previous torn-tape system. What's more, the increased reliability and efficiency of the Datanet-30 has resulted in 50 percent less lost traffic or traffic that must be repeated.

Planning

Chrysler has been planning a fully-automatic communications switching center since 1954, when it began studies to determine total corporate communications requirements and to provide for these needed services. In 1956 a Functional Torn Tape System was installed — the first and largest of its type for an industrial corporation. In this system all stations were connected to a relay center where all messages were received in the form of perforated

tape. Relay operators read the addresses and placed each message in an automatic transmitter for relay to its proper destination.

This system, while using the most modern equipment available, still was relatively slow and inflexible. For example, under optimum conditions, it took 26 minutes to deliver a short message originating in Moncton, New Brunswick, to a Chrysler office in Vancouver, British Columbia. Using the Datanet-30, it is now accomplished in 35 seconds.

In 1957, the various Chrysler plants and offices in Canada were added to the network. During 1959, Chrysler International, S.A., with headquarters in Geneva, Switzerland was added. It soon became apparent that the traffic volume was too great for the existing torn tape system to handle. Here started the search for automatic relay equipment which ended with the installation of the General Electric Datanet-30 in 1963. And, in the Datanet-30, Chrysler found that all its criteria could be satisfied without increasing the existing teletype system costs!

The Criteria

Chrysler's communication philosophy played an important role in planning its ultimate system. A highly-qualified engineering group within Chrysler, armed with a firm definition of corporate requirements and needs, set up certain criteria and qualifications which they demanded of the automatic switching center selected. One basic principle was considered mandatory: every communication — policy messages, orders, parts inventories, reports, etc. — is urgent, perishable, and completely necessary to a profitable operation. Working from here, firm criteria were specified including:

1. Automatic switching of messages by routing codes inserted in the header of each message;
2. Automatic switching of multi-address messages;
3. Automatic control of cycle which polls each station and picks up messages waiting for transmission at the outlying stations;
4. Verification of circuit continuity through continuous polling cycle and alarm (or print-out) if circuit failures occur;
5. Provision for transmission to the out station without operator attendance at the out station;
6. Sequential storing of messages waiting transmission from the center to an out station, whether caused by high traffic volumes or by equipment outage;
7. Interception of messages with garbled or invalid directing codes;
8. Competent performance of all the other usual functions associated with electro-mechanical switching centers.

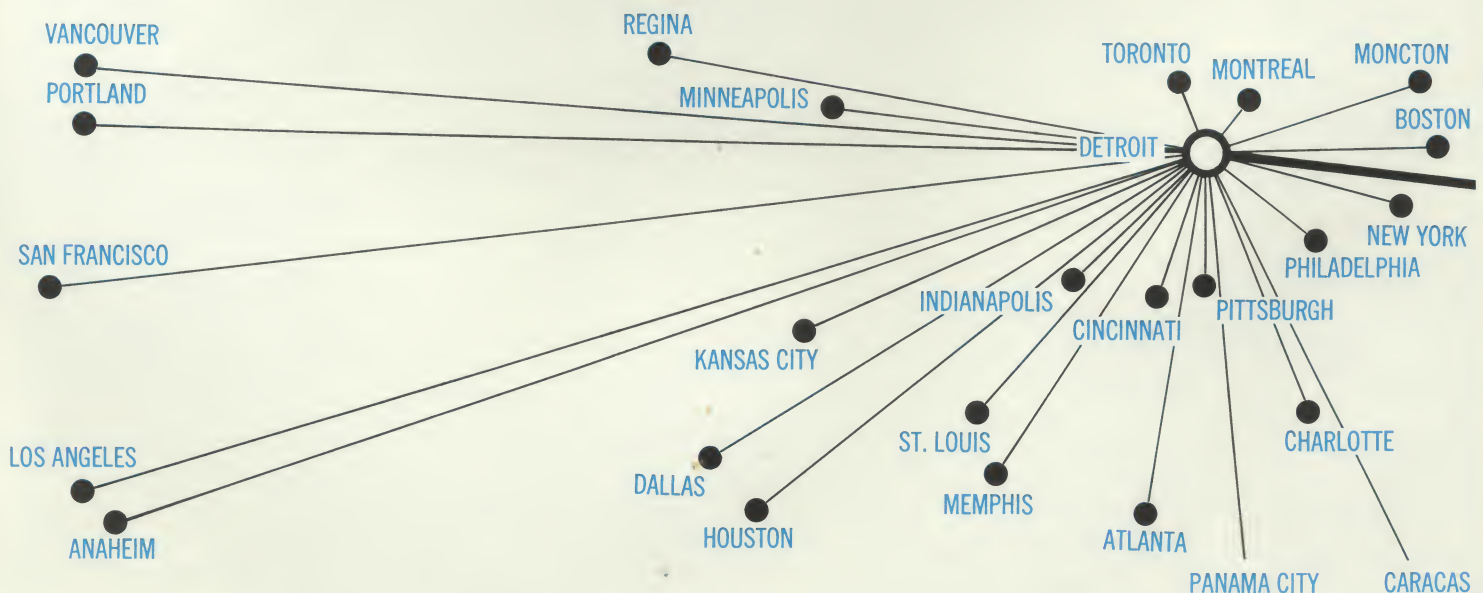
Chrysler chose the Datanet-30 after a complete survey of existing equipment and a search in depth for a supplier. Aside from the fact that General Electric's Datanet-30 was the only **true communications processor** offered — all others being "batch" computers first, with switching capabilities as a secondary function — Chrysler was impressed that it "did not have to educate General Electric . . .". As one remote operator phrased it after the system was in place and operators were queried as to their opinion of the Datanet-30 and its operation:

"A little over a month ago Webster did not have enough unpleasant words in his book to describe how I felt about this new system. I never thought it would work but at the same time I did have enough **confidence in General Electric and the people at Chrysler** who decided to install this system."

The Datanet-30 Installation

The Chrysler switching center consists of a special purpose computer designed specifically for the switching operation. The following units are in place:

- A central processing unit with 8192 words of core memory;
- Twenty full-duplex line terminal units equipped with bit buffers;
- One mass random access disc storage unit (DSU);
- A restart option that provides for automatic re-loading of the program in case of malfunction.



How Chrysler's Switching Center Works

The Chrysler switching center automatically receives and retransmits all communications within the corporate set-up. Its primary job is to reduce delays, cutting re-transmission "holds" during peak periods from two hours to only four minutes. The center has an initial capacity for connection of 25 full duplex teletype circuits. Nineteen of these are now in operation. All of the circuits are 100 word-per-minute, full-duplex lines. The majority are multi-point. Outlying station equipment is 28-type teletype equipment with station control provided with electronic selector units.

All stations are identified by a five-character mnemonic code. This code enables identification of each station as to group, city, and function. The code is translated by the Datanet-30 to determine the proper circuit and connect code for the proper station on the circuit.

In addition, the Datanet-30 at Chrysler provides the following:

1. Automatic accumulation of traffic load statistics on any basis Chrysler wishes — hourly, daily, weekly, etc. These statistics provide Chrysler with the number of words sent by each station and received by each station, together with the time of day the message was transmitted.
2. Automatic (through a sub-program) accumulation of billing information by applying a rate structure to the traffic load statistics.
3. Code conversion which enables Chrysler to relay directly from the system to their European

stations and vice versa, using the full keyboard of each type of teletype equipment.

4. Automatic message delivery verification. The switcher program checks sequence numbers on incoming messages for each station, inserts the sequence number on each outgoing message, and then cross-references these numbers for message retrieval.
5. No delay or lost circuit time on delivery of multi-address messages since the message is retrieved from queue storage as each addressee's circuit becomes available.
6. Ability to handle traffic fluctuations without adding or decreasing operating personnel at the switching center.
7. Ability to operate circuits at different speeds, thus allowing the most economical tariff application.
8. Lessened local delivery problems, through use of receiving-only machines in departments or groups with high volumes of received traffic.
9. Much smaller space requirements for switching center and installation of the center remote from the location of the supervising operator.
10. Expansion capabilities through increased capacity of the central switcher or the installation of remote switchers in other parts of the country.



"Dedicated" Communications Processor

Quoting the Manager of Corporate Data Processing and Communications at Chrysler — "We believe the Datanet-30 is the only 'dedicated' communications processor in use today!" Designed and built **exclusively** as a communications processor, the Datanet-30 has more than met Chrysler's expectations. Significant benefits realized include:

- ■ A decided increase in reliability and efficiency — traffic is now getting to its determined destination with 50 percent less lost traffic or traffic that must be repeated.
- ■ The "burden of proof" has been shifted from the switching center and placed where it naturally belongs — on the local operator. Since each message is transmitted sequentially and the Datanet-30 instantly recognizes out-of-sequence traffic, it immediately advises the sending operator of the error. This gives a measure of control never before experienced at Chrysler.
- ■ Decisions can be made and/or action taken on the basis of reliable, intelligent information. Datanet-30 will intercept a garbled message header and ask the operator to repeat. Therefore, message receivers can be sure that information is received exactly as it was sent.
- ■ With the Datanet-30 a better diagnosis of station or circuit difficulty is effected including line out, tape difficulties, etc. Access to information is fast. Therefore, the time-consuming

elements usually inherent in tracking bad traffic have been almost eliminated.

- ■ Exact records can be kept of what is going on in the system. Reports are scheduled hour-by-hour, or can be called in on demand. The Datanet-30 provides the following reports: Circuit-by-station per hour; Queue Report by Circuit (number of messages); Program Utilization (percentage and time per hour); and a Summary Report.
- ■ Almost three times as many messages can be handled as could be with the old torn tape system.

The Future

Chrysler is well aware and will be the first to admit that it does not fully know the capabilities of the Datanet-30. But already Chrysler is looking ahead. Their systems engineers are studying a corporate data handling centralization project which would combine 11 manufacturing group processing centers into three and would require transmitting 1.6 billion bits of Datanet-30 data every month among plants and group headquarters.

Search and retrieval potential is limitless. The Datanet-30 could be connected to other data processing equipment arranged for interrupt access to mass storage media. This type of connection will provide all or selected stations on the system with remote inquiry ability to determine availability of parts, status of vehicles, or whatever they may wish to store on a random access system.

From General Electric

The Datanet-30 installation at Chrysler has definitely proved the competence and economy of this unique communications processor. The full potentialities of this computer have not yet been realized. Eight-channel paper tape equipment, magnetic tape transmission equipment, high-speed card readers, 150 or 300 line-a-minute page printers, remote inquiry of master files — these are all possibilities for inclusion in the system. Imagination should know no bounds. Chrysler has stated — "You don't have to educate General Electric." With our vast experience and knowledge of engineering and communications systems — both theory and practice — plus this practical and proved system at Chrysler, we are qualified and eager to help you solve your communications problems.

Why not talk to the trained specialists at General Electric? All it takes is a phone call to a District Office near you — or to the Computer Department, Phoenix, Arizona.



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